

The 4th State

Newsletter of the Institute for Plasma Research, Gandhinagar, Gujarat (India)

Issue 145, August 2025



Our New Director



Dr. Tapas Ganguli

Dr. Tapas Ganguli has taken charge as the Officiating Director of the Institute for Plasma Research (IPR) on 01 Jul 2025. In addition to his responsibilities at IPR, he also heads the Accelerator Physics and Synchrotron Utilization Division at Raja Ramanna Centre for Advance Technology (RRCAT), Indore, MP.

At RRCAT, Dr. Tapas Ganguli and his team is responsible for design, development, and operation of synchrotron radiation-based beamlines on Indus-1 and Indus-2, which are national user facilities. He also heads the team that is involved in the physics design and user beamline design of a new High brilliance Synchrotron Radiation Source (HBSRS): Indus-3.

Dr. Tapas Ganguli is a senior Professor of the Homi Bhabha National Institute (HBNI) in Physical Sciences. His main area of research includes materials science and solid-state physics, with principal interest in bulk and thin film oxide semiconductors and intermetallic alloys. He has primarily concentrated on X-ray based analytical techniques like diffraction, absorption spectroscopy and electron spectroscopy. He led the team that designed, developed and commissioned the Angle Resolved Photoelectron Spectroscopy Beamline and X-ray Magnetic Circular Dichroism Beamline, which were the first two insertion device beamlines at Indus-2. He has been the course instructor and coordinator of courses taught for PhD and BARC training school students at RRCAT, and a member of the HBNI standing academic committee at RRCAT. He has published more than 125 papers in peer reviewed journals.

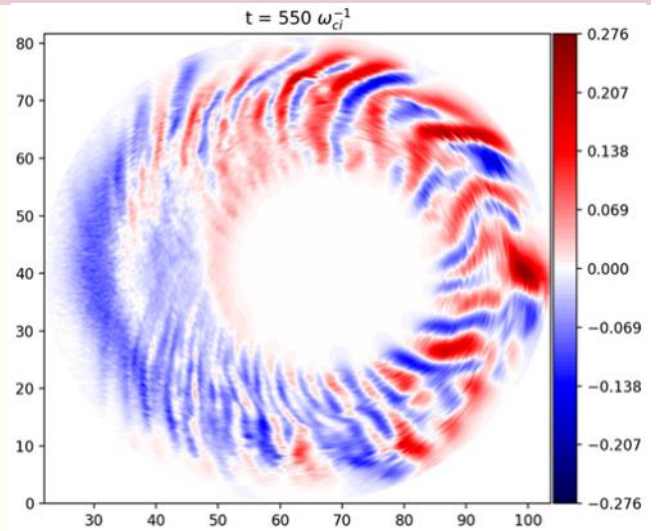
IPR warmly welcomes Dr. Ganguli as its new Director.

The study uses global, nonlinear gyrokinetic simulations to show that Ubiquitous Modes (UMs) can drive robust turbulence in LTX-like tokamaks, even with flat temperature profiles.

Unlike conventional Trapped Electron Modes (TEMs), UMs propagate in the ion diamagnetic direction and dominate linear instability at high mode numbers. Interestingly, the zonal flow response is found to be weak, offering limited turbulence suppression. However, nonlinear effects lead to an inverse cascade, transferring energy to lower- n modes resulting in turbulence, which rotates in the electron diamagnetic drift direction, signaling strong UM-TEM coupling.

The paper is authored by Sagar Choudhary, Gopal Krishna M, Jugal Chowdhury, Amit K. Singh, Jagannath Mahapatra, Thomas Hayward-Schneider, Emmanuel Lanti, Rajaraman Ganesh and Laurent Villard, published in the journal Nuclear Fusion, Volume 65, Number 8

Full-Text: <https://iopscience.iop.org/article/10.1088/1741-4326/ade816>



Mode structure on a poloidal plane during the transition from linear to non-linear phase, displaying the onset of turbulence.

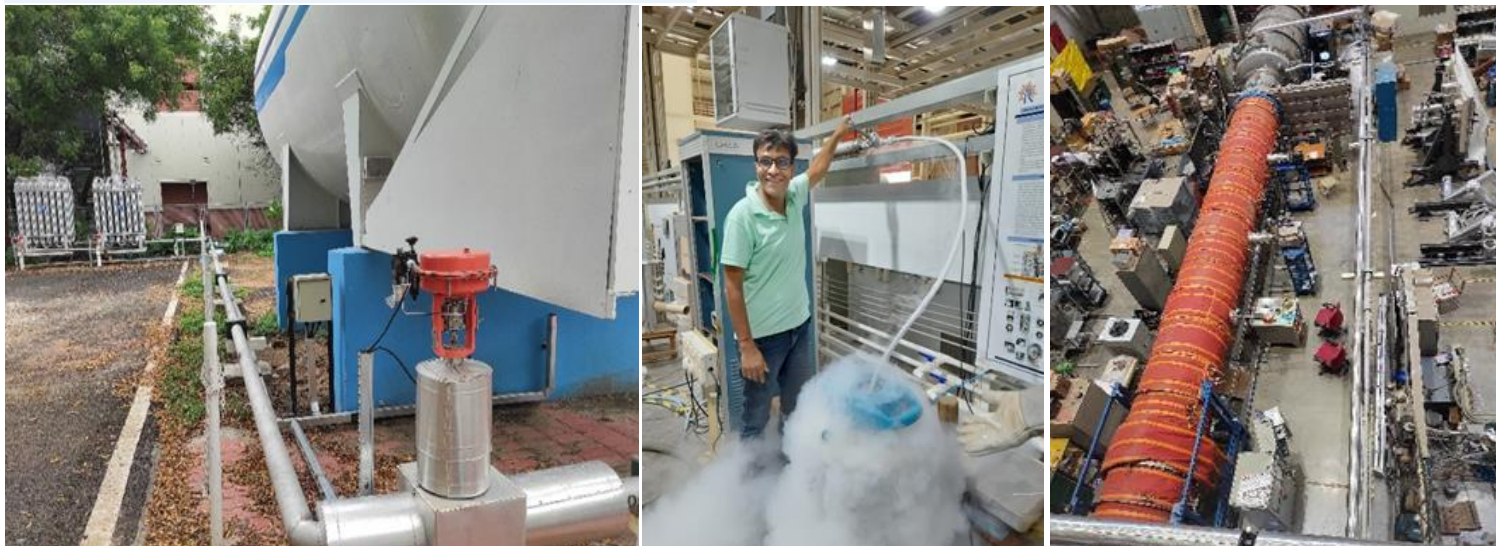
Installation of Centralized LN₂, GN₂ and Vent lines distribution network

As a part of continued efforts to strengthen the for R&D activities, IPR has designed and implemented a fully automated, centralized system to supply Liquid Nitrogen (LN₂) and Gaseous Nitrogen (GN₂) to various experimental labs located in the new R&D lab at IPR.

This advanced system is capable of delivering LN₂ at a flow rate of approximately 125 g/s and GN₂ at 225 g/s, ensuring uninterrupted supply for a range of scientific experiments. The LN₂ lines have been specially engineered to minimize transfer losses, thereby conserving resources and lowering operational costs. In a move to further enhance efficiency, the system utilizes a dedicated pipeline to draw LN₂ and GN₂ directly from the existing central storage tank - eliminating the need for a separate tank and optimizing both space and cost. The project was completed on schedule and was formally inaugurated by the Director, IPR, on 25th June 2025. This new facility represents a significant step forward in supporting advanced research and development activities at IPR.



Director IPR (former) visiting the operation facility



Distribution from LN₂ storage tank (L), Filling of LN₂ in the container from the distribution system (C), Supply of LN₂ to LI-VISTA facility (R)

MoU signed between AIC-IPR and HBNI

3

AIC-IPR Plasmatech Innovation Foundation, an Atal Incubation Centre established by Institute for Plasma Research (IPR) as a Section 8 company has been fostering and supporting tech based and deeptech startups. With an objective to further strengthen deeptech Innovation in the country and encourage Plasmapreneurship within HBNI students, an MoU has been executed on 24 June 2025 by and between HBNI and AIC-IPR at HBNI Council Hall, Mumbai. The MoU was executed by Prof. U. Kamachi Mudali, Vice Chancellor, HBNI and Dr. D. K. Aswal, Chairman, AIC-IPR & Director - IPR (former).

This MoU will open up new opportunities for all the current and past students of HBNI to explore deeptech entrepreneurship. Both organizations will also conduct joint programmes on innovation, incubation and entrepreneurship involving all ecosystem partners. This MoU marks DAE's commitment towards Atmanirbhar Bharat and Startup India initiatives of Government of India.



MoU execution between AIC-IPR and HBNI

Experimental and Molecular Dynamics Studies of Transport Phenomena in a Complex Plasma by Ankit Dhaka

A complex plasma (or dusty plasma) is a type of plasma that contains ions, electrons, and dust grains. The understanding of transport phenomena is an important area of fundamental studies in plasmas that also has important practical applications. This thesis explores transport processes in a dusty plasma, focusing on mechanisms that are either a consequence of spontaneous thermal fluctuations or are driven by an agent using theory, simulations and experiments.

Firstly, an analytical form of a density autocorrelation function (DAF), a marker of the time dynamics of density fluctuations, is derived for a strongly coupled complex plasma. The accuracy of the derived expression is evaluated by comparing it with existing results in the literature in relevant asymptotic limits. A comprehensive validation of the analytical results [1] is performed by molecular dynamics (MD) simulations of complex plasma, shown in Fig. 1(a). For a practical application of the technique, a new Capacitively Coupled Dusty Plasma Experimental (CCDPx) device [2] is designed and commissioned at the Institute for Plasma Research. The dusty plasma is produced by the introduction of monodisperse microspheres of melamine formaldehyde in the radio-frequency discharge shown in Fig. 1(b). The device features an innovative lower electrode capable of creating several potential wells to trap dust particles in one-, two- or three-dimensional configurations. The DAF of the dust density fluctuations is determined by optically tracking the trajectories of the dust particles in a 2D configuration. The experimentally obtained DAF is found to be consistent with theoretical and numerical predictions [3]. The DAF based approach is employed to estimate transport coefficients from simulations and experiments, extending Landau-Placzek observation to strongly coupled systems.



To explore the weakly coupled regime, the experiments of CCDPx are operated with smaller spatial correlations, leading to a fluid state of complex plasma. In this regime, the formation of self-sustaining convective patterns in 3D dust clouds are observed. Particle tracking measurements show an ion flux-induced dust temperature gradient that is responsible for the convective patterns, which is also confirmed by MD simulations [4]. Finally, the thermal relaxation of collective modes is studied in the context of energy-transfer rates at different length scales. A 1D chain of dust particles is formed in the CCDPx device by modifying the trapping potential. Collective modes excited by chopped laser beam are used to observe the relaxations, a nonlinear phenomenon, by 'switching off' the excitation [5]. The experimental findings, covering a wide parameter regime, are compared with classical MD simulations to provide physical insights into the observed novel features of the nonlinear phenomena. The results of the present thesis could prove useful in understanding spontaneous and driven transport in strongly coupled systems that are associated with nonlinear pattern formations and/or nonlinear mode interactions.

Publications:

- [1] Dhaka, A., Subhash, P. V., Bandyopadhyay, P., & Sen, A. (2022). Auto-correlations of microscopic density fluctuations for Yukawa fluids in the generalized hydrodynamics framework with viscoelastic effects. *Scientific Reports*, 12(1), 21883. <https://doi.org/10.1038/s41598-022-26401-w>
- [2] Dhaka, A., Bandyopadhyay, P., Subhash, P. V., & Sen, A. (2024). Experimental validation of the analytic model for the temporal decay of the density auto-correlation function in a strongly coupled dusty plasma. *Physics of Plasmas*, 31(4). <https://doi.org/10.1063/5.0185625>
- [3] Dhaka, A., Bandyopadhyay, P., Subhash, P. V., & Sen, A. (2024). Spontaneous convective pattern formation in a dusty plasma. *Physics of Plasmas*, 31(7). <https://doi.org/10.1063/5.0211636>
- [4] Dhaka, A., Bandyopadhyay, P., Subhash, P. V., & Sen, A. (2025). CCDPx: A Versatile Experimental Device for Studying Multi-dimensional Complex Plasma Configurations, *Under Communication*.
- [5] Dhaka, A., Bandyopadhyay, P., Subhash, P. V., & Sen, A. (2025). Mode Coupling Induced Thermal Relaxation in a 1D Dusty Plasma, *Under Communication*.

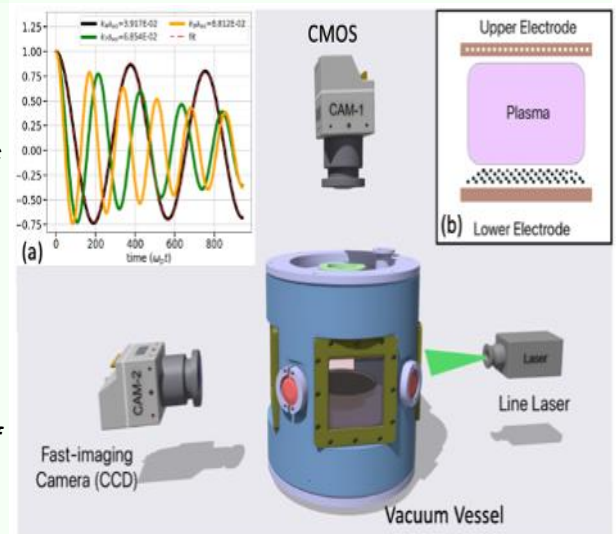


Fig. 1 inset (a) DAF from MD simulations plotted
inset (b) Schematic of CCDPx device with
plasma discharge

राजभाषा स्वर्ण जयंती समारोह में प्रतिभागिता

5

हमारा यह निरंतर प्रयास रहना चाहिए कि हिंदी भाषा समृद्ध कैसे बने। कार्यशालाओं के द्वारा भाषाशास्त्री विभिन्न भारतीय भाषाओं के शब्द हिंदी में जोड़कर इसे समृद्ध बनाएं।

-प्रधानमंत्री श्री नरेंद्र मोदी

भारत में राजभाषा हिंदी के क्रियान्वयन के 50 वर्षों की यात्रा के उपलक्ष्य में 26 जून 2025 को नई दिल्ली में राजभाषा स्वर्ण जयंती समारोह का भव्य आयोजन किया गया, जिसमें हिंदी की राष्ट्रीय एकता एवं शासन व्यवस्था में महत्वपूर्ण भूमिका को रेखांकित किया गया। इस अवसर पर हमारे संस्थान से डॉ. राज सिंह, वैज्ञानिक अधिकारी-एच, डॉ. रितेश सुगंधी, वैज्ञानिक अधिकारी-जी एवं श्री मुकेश सोलंकी, कनिष्ठ हिन्दी अनुवादक ने सहभागिता की। समारोह में प्रतिष्ठित विद्वानों द्वारा हिंदी की प्रगति और चुनौतियों पर आधारित सारगर्भित व्याख्यान दिए गए, साथ ही माननीय गृह मंत्री श्री अमित शाह द्वारा कई महत्वपूर्ण पुस्तकों का विमोचन भी किया गया। सांस्कृतिक कार्यक्रमों ने सम्मेलन को और भी प्रभावशाली बनाया।

राजभाषा स्वर्ण जयंती समारोह का दूसरा कार्यक्रम हैदराबाद में आयोजित किया गया। दिनांक 11 जुलाई 2025 को जी एम सी बालयोगी इनडोर स्टेडियम, हैदराबाद में राजभाषा विभाग, गृह मंत्रालय की स्वर्ण जयंती के उपलक्ष्य में 'दक्षिण संवाद' नामक एक भव्य समारोह का आयोजन किया गया, जिसमें केंद्रीय कोयला एवं खान मंत्री जी. किशन रेड्डी मुख्य अतिथि रहे। इस कार्यक्रम में संस्थान की ओर से डॉ. सूर्यकान्त गुप्ता, वैज्ञानिक अधिकारी-जी एवं श्री सरोज दास, वैज्ञानिक अधिकारी-ई ने भाग लिया। कार्यक्रम का उद्देश्य हिंदी को एक सामंजस्यपूर्ण, संवाद के रूप में स्थापित करना था, जिसमें विभाग की 50 वर्ष की यात्रा, राजभाषा नीतियों की उपलब्धियाँ, तकनीकी पहलें और दक्षिण भारतीय भाषाओं के साथ सौहार्द की भावना सम्मिलित थी।

राजभाषा विभाग स्वर्ण जयंती समारोह (दक्षिण संवाद) राजभाषा विभाग @50 (1975-2025)

जीएमसी बालयोगी इंडोर स्टेडियम, हैदराबाद
11 जुलाई 2025



हैदराबाद में आयोजित समारोह में मुख्य अतिथि केंद्रीय कोयला एवं खान मंत्री जी. किशन रेड्डी (बाए से चौथे)



दिल्ली में आयोजित समारोह में डॉ. राज सिंह एवं डॉ. रितेश सुगंधी



हैदराबाद में आयोजित समारोह में श्री सरोज दास एवं डॉ. सूर्यकान्त गुप्ता

A Talk on “Global Fusion Scenario & ITER Private Sector Fusion Engagement”

A Talk by Dr. Nitendra Singh from ITER Organization, France was organized on 15 July 2025 at IPR.

Abstract of the Talk: The global fusion energy landscape is undergoing a transformative shift, driven by synergistic advances in public sector research, international cooperation, and a rapidly expanding private fusion industry. At the core of this development is the ITER Organization, a landmark megaproject involving 33 nations, which aims to demonstrate the scientific and engineering feasibility of sustained nuclear fusion via magnetic confinement using the tokamak approach. ITER serves as a central testbed for integrated plasma physics, superconducting magnet systems, tritium breeding strategies, and power handling technologies—laying the groundwork for future demonstration plants. India, being one of the members of ITER organization, is advancing ahead with emerging private fusion companies and leading supply chain. Concurrently, the emergence of over 40 private fusion ventures—including leading firms like TAE Technologies, Commonwealth Fusion Systems, and Helion Energy—signals a paradigm shift. These companies are leveraging compact designs, novel confinement approaches (e.g., field-reversed configurations, magneto-inertial fusion), and advanced materials. This talk will underscore the critical function of the ITER Private Sector Fusion Engagement initiative in driving fusion forward as a cornerstone of the global clean energy transition and discusses the pathways for collaborative effort for faster fusion commercialization.



Head ORD, Dr. Ramasubramanian giving an introduction



Dean (R&D), Dr. P. Chaudhuri introducing the speaker



Dr. Nitendra Singh delivering his talk



Audience attending the Talk

हिंदी कार्यशाला

7

दिनांक 08 जुलाई 2025 को संस्थान के सेमिनार हॉल में "छुट्टी यात्रा रियायत (LTC) नियमों पर एक विस्तृत नज़र" विषय पर हिन्दी व्याख्यान का आयोजन किया गया। व्याख्यान के वक्ता श्री निलयकुमार अध्वर्यु, लेखाधिकारी-1, आई.पी.आर. ने एलटीसी से जुड़े नवीनतम नियमों, हवाई, रेल एवं सड़क यात्रा की पात्रता, टिकट बुकिंग की समय-सीमा, अग्रिम राशि, आवश्यक दस्तावेजों एवं प्रतिपूर्ति प्रक्रिया के बारे में जानकारी प्रदान की। रेल एवं सड़क यात्रा से संबंधित नई गाइडलाइंस, जैसे कि केवल सीधी एवं न्यूनतम दूरी की यात्रा की प्रतिपूर्ति, कन्फर्म टिकट की अनिवार्यता और सरकारी बसों से यात्रा की शर्तों को भी स्पष्ट किया गया। श्री निलयकुमार ने पावरपॉइंट प्रस्तुतियों एवं उदाहरणों की सहायता से विषय को सरलता से समझाया। व्याख्यान के दौरान कर्मचारियों द्वारा एलटीसी से संबंधित कई प्रश्न पूछे गए जिस पर विस्तृत चर्चा की गई।



उपस्थित श्रोतागण



श्री निलय अध्वर्यु (L) को भेंट प्रदान करते हुए श्री मनु बाजपेयी (R)



उपस्थित श्रोतागण

Summer School Program 2025 - Poster Presentations

SSP-2025 poster session was scheduled on 04 July 2025. The posters were presented by the students from both, Physics and Engineering Disciplines. The poster session was open for all IPR staff and research scholars. The posters were judged by a team of senior scientists. The students were excited to present their work. Many staff members and scholars visited the session and interacted with the students. The best posters were given awards during the concluding ceremony.



Glimpses of SSP-2025 Poster Presentation Session



Glimpses of the SSP-2025 Poster Presentation Session



List of SSP 2025 Poster award Winners

Name	Award/Category	Project Title
Akhila K C	First/Best Poster Award (Physics)	Cavity Ring-Down Spectroscopy to Evaluate the Negative Hydrogen Ion Density at the Negative Hydrogen Ion Source
Aditya Joshi	Second/Best Poster Award (Physics)	Modelling of HPGE detector for efficiency calibration
Shruti Patel	Third/Best Poster Award (Physics)	Langmuir Probe Diagnostics for Helicon Thruster Plasma Characterization
Ameena M Thayyil	First/Best Poster Award (Engineering)	Developing Secure File Encryption and Decryption with Strong Cryptographic Algorithm
Hritadip Dutta	Second/Best Poster Award (Engineering)	Improved Thermocouple Signal Acquisition for High Heat Flux Test Facility



Winners receiving their trophies and certificates.

Top (L-R): Akhila K C, Aditya Joshi and Shruti Patel

Bottom (L-R): Ameena M Thayyil and Hritadip Dutta



[Watch the Video](#) compilation of the feedback by the Students

Under the auspices of "Azadi Ka Amrut Mahotsav", IPR participated under the banner of Department of Atomic Energy (DAE) in the exhibition "Samridh Gujarat 2025" which was organized at the Sardar Patel Seva Samaj, Navrangpura, Ahmedabad during 3-5 July 2025. Several Departments of the Government of India participated in this 3-day exhibition. The programme was organized by the Sansa Foundation and emerged as a landmark event in India's ongoing development journey as part of the visionary guidance of Shri Dinesh Makwana, Hon'ble Member of Parliament, Lok Sabha, whose commitment to the principle of "Vikas ke liye Jan Bhagidari" (People's Participation for Development) served as the cornerstone of this initiative.

Students from nine schools and general public from Ahmedabad visited the DAE -IPR stall in this exhibition. The DAE-IPR stall also received the award for the "Best Stall in Advancing Nuclear Science for Sustainable Scientific Innovation" from Shri Dinesh Makwana, who also visited the IPR stall and interacted with the IPR outreach staff members.



Glimpses of the IPR stall at SAMRIDH GUJARAT 2025 event



IPR ORD Team receiving the award from Shri Dineshbhai Makwana, Hon'ble Member of Parliament, Lok Sabha

Date	Institution	Visitors
18 Jun 2025	New Life International School, Gandhinagar	35 Students and Teachers of class IX and X
24 Jun 2025	LDRP-ITR, Gandhinagar	52 Students and Faculty, Sem 5 IT (Batch 1)
25 Jun 2025	LDRP-ITR, Gandhinagar	57 Students and Faculty, Sem 5 IT (Batch 2)
26 Jun 2025	LDRP-ITR, Gandhinagar	62 Students and Faculty, Sem 5 IT (Batch 3)
30 Jun 2025	Shree Swaminarayan Institute of Technology (SSIT), Bhat, Gandhinagar	102 Students and Faculty, Sem 1



Students and Teachers from New Life International School, Gandhinagar visiting IPR on 18 Jun 2025



LDRP-ITR, Gandhinagar Students visiting ORD on 24 Jun 2025



Students and Faculty from LDRP-ITR, Gandhinagar visiting IPR on 25 Jun 2025



Students and Faculty from LDRP-IPR, Gandhinagar visiting IPR on 26 Jun 2025



Students and Faculty from SSIT, Gandhinagar visiting IPR on 30 Jun 2025

Superannuation



Happy Retirement

Mr. Kiran Padia
superannuated from
services on 31st July 2025.
He has served the Institute
for more than 35 years.

IPR wishes you a very
Happy and Healthy
Retired Life!

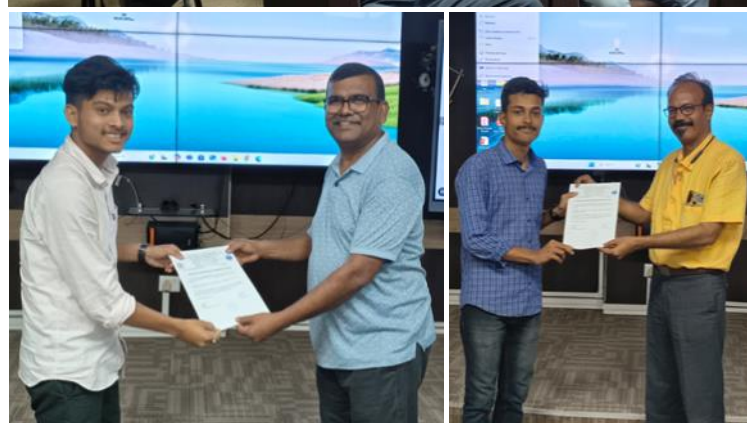
Happy Retirement

Dr. Mukti Ranjan Jana
superannuated from services on
31st July 2025.
He has served the Institute for
around 30 years.

IPR wishes you a very Happy and
Healthy Retired Life!

Undergraduate Internship programme at CPP-IPR

CPP-IPR conducted Under Graduate Internship Program 2025 from 1st to 18th July, 2025. This was organised in response to the request from various colleges and universities of Assam to conduct such a program for their undergraduate students as required under the National Education Policy (NEP) 2020. The program was designed to give an exposure to theoretical and experiments works relevant to the field of plasma science and technology. It consisted of lectures, laboratory visits and minor projects. The program was attended by 42 participants from 5 colleges and 3 universities.



Undergraduate Internship Programme at CPP-IPR, Guwahati

- ◆ **Dr. Mayur Mehta**, gave a talk on "Systematic analysis of (n,2n) reaction cross-section of zinc using 14 MeV neutron generator facility at IPR" at 16th Nuclear Data for Science and Technology Conference, Madrid, Spain, 22-27 June 2025
- ◆ **Mr. Deepak Sharma**, gave a talk on "Conceptual Design of Solid Breeder Blankets for Fusion Pilot Plants" at 2025 IEEE Symposium on Fusion Engineering (SOFE2025), MIT, Cambridge, USA, 23-26 June 2025
- ◆ **Dr. Anshu**, gave a talk on "Analysis of ECRH Shot Data and Predictive Characterization of Wave Propagation in Aditya-U" on 24th June 2025
- ◆ **Dr. Debashrita Mahana**, gave a talk on "Improving Electrolytic Conditions for Efficient Hydrogen Generation through Plasma Electrolysis" on 30th June 2025
- ◆ **Mr. Rajiv Sharma**, gave a talk on "Design, development and testing of dissimilar material joints for cryogenic services of superconducting fusion machine" on 01st July 2025
- ◆ **Dr. P Chandrakanta Singh**, gave a talk on "Laser generated micro/nanostructures on metallic surface: Its implications in biomedical engineering and laser induced breakdown spectroscopy" on 08th July 2025
- ◆ **Dr. Amba Sankar K N**, gave a talk on "Tailoring Bifunctional Electrocatalysts Through Plasma-Mediated Surface Activation for Enhanced Water Electrolysis" on 14th July 2024
- ◆ **Dr. Debkumar Chakraborty**, gave a talk on "Fluid Simulation Framework for Debris-Induced Plasma Waves" on 15th July 2025
- ◆ **Shri. Nitendra Singh**, ITER Organization, France, gave a talk on "Global Fusion Scenario & ITER Private Sector Fusion Engagement" on 15th July 2025

Upcoming Events

- ◆ 6th International Conference on Data-Driven Plasma Science (ICDDPS-6), New Mexico, USA, 4-8 August 2025; <https://web.cvent.com/event/7de9d238-e170-4fbf-8de5-20abc5c6eb49/summary>
- ◆ 10th International Youth Conference on Energy (IYCE'25), Budapest, Hungary, 5-9 August 2025; <https://www.iyce-conf.org/welcome>
- ◆ North American Particle Accelerator Conference (NAPAC25), Sacramento, California, 10 - 15 August, 2025; <https://events.slac.stanford.edu/napac25/>
- ◆ International Radiological Protection School (IRPS), Stockholm University, Sweden, 11 - 15 August 2025; https://www.oecd-nea.org/jcms/pl_101090/international-radiological-protection-school-irps-at-stockholm-university-2025-edition
- ◆ 21th Summer Training Course in Prague (SUMTRAIC 2025), Prague, Czech Republic, 25 August 2025 - 5 September 2025; <https://indico.ipp.cas.cz/event/39/>
- ◆ 21st International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-21), Busan, South Korea, 31 August 2025 - 5 September 2025; <https://www.nureth-21.org/>

Conference Presentations

1st International Conference on Power Electronic Converters for Transportation and Energy Applications (PECTEA-2025), IIT-Bhubaneswar

Mr. Meddi Tharun, gave an oral presentation titled "**New Systematic Design Methodology of Modular Multilevel Converters in Rectifier Applications**" at 1st International Conference on Power Electronic Converters for Transportation and Energy Applications (PECTEA-2025), Indian Institute of Technology, Bhubaneswar, 18-21 June 2025.

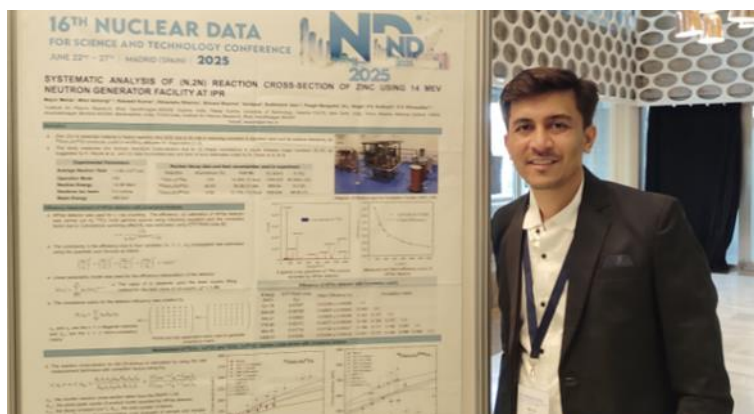


Mr. Meddi Tharun giving his presentation

Conference Presentations

16th Nuclear Data for Science and Technology Conference (ND2025), Madrid, Spain

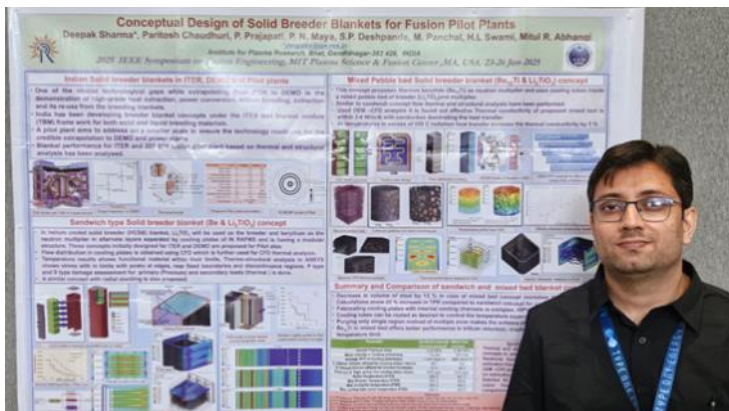
Mr. Mayur Mehta, gave a poster presentation titled **"Systematic analysis of $(n,2n)$ reaction cross-section of zinc using 14 MeV neutron generator facility at IPR"** at the 16th Nuclear Data for Science and Technology Conference, 7-11 Jul 2025.



Mr. Mayur Mehta during the poster presentation

2025 IEEE Symposium on Fusion Engineering (SOFE2025), USA

Mr. Deepak Sharma, gave a poster presentation titled **"Conceptual Design of Solid Breeder Blankets for Fusion Pilot Plants"** at the 2025 IEEE Symposium on Fusion Engineering (SOFE2025), MIT, Cambridge, USA, 23-26 Jun 2025.



Mr. Deepak Sharma during the poster presentation

Fourth International Conference on Advances in Plasma Science and Technology (ICAPST-25), Coimbatore

Dr. Mukesh Ranjan gave an invited talk about **"Plasma Surface Engineering for Sensing and Wettability Application"** in Fourth International Conference on Advances in Plasma Science and Technology (ICAPST-25), Coimbatore (ICAPST-25)", 16-18 July 2025, held at Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore, India.



Dr. Mukesh Ranjan giving his talk and being felicitated



Ms. Debanjali Roy, Senior Research Fellow from Helicon Plasma Source (HeliPS) laboratory, CPP-IPR gave an oral presentation titled **"A Study on the Discharge Properties of Argon Blue Core Plasma"** in Fourth International Conference on Advances in Plasma Science and Technology (ICAPST-25), Coimbatore (ICAPST-25)", 16-18 July 2025, held at Sri Ramakrishna Mission Vidyalaya College of Arts and Science, Coimbatore, India.

Ms. Debanjali Roy giving her talk

51st EPS Conference on Plasma Physics, Vilnius, Lithuania

Ms. Geethika B R, Research Scholar, gave a poster presentation titled **"Study on Polarized Emission and its effect on Laser Induced Breakdown Spectroscopy"** at the 51st EPS Conference on Plasma Physics, Vilnius, Lithuania, 7-11 Jul 2025.



Ms. Geethika at the conference

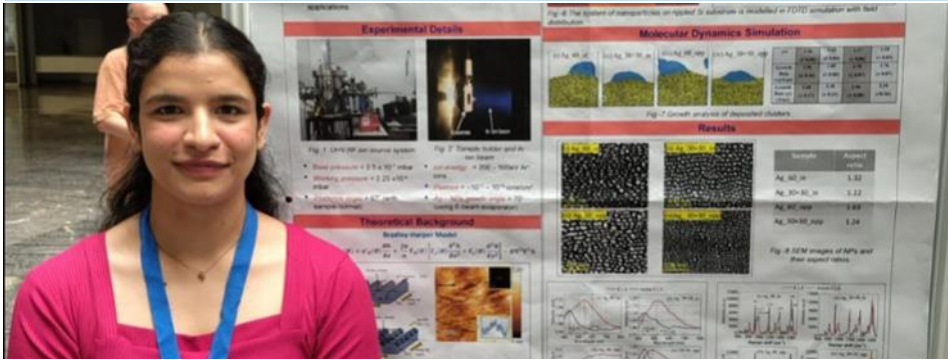
51st EPS Conference on Plasma Physics, Vilnius, Lithuania

Mr. Pabitra Kumar Saha, Senior Research Fellow from Helicon Plasma Source (HeliPS) laboratory, CPP-IPR presented a poster titled **“Generation of Multiple Double Layers and Ion Beam in RF Expanding Plasma”** in 51st EPS Conference on Plasma Physics from July 7-11, 2025, organized in Lietuva, Vilnius, Lithuania.



Mr. Pabitra Kumar Saha presenting his poster

15th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Spain



Ms. Tarundeep Kaur, Research Scholar, presented a poster title **“Sequential Deposition of Ag Nanoparticles on Si ripple for LSPR anisotropy minimization and SERS application”** at the 15th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Malaga, Spain, 22 - 25 July, 2025

Ms. Tarundeep Kaur presenting her poster

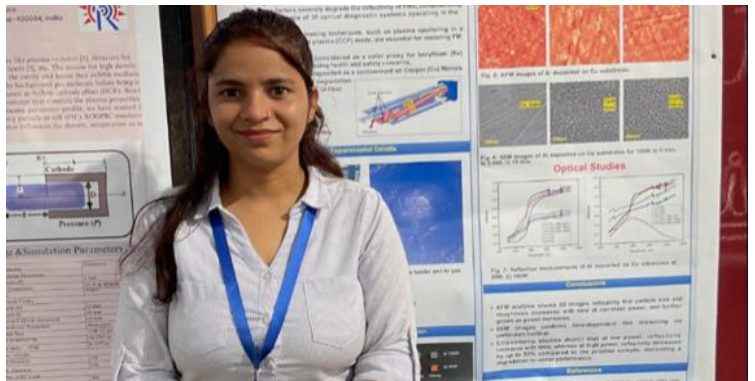
11th Plasma Student Colloquium (PSSI-PSC-2025), Indore

Dr. Rohit Sharma, Post-Doctoral Fellow, gave the oral presentation title **“Production of superhydrophobic fabric using argon plasma and HDTMS coating.”** In the PSSI-PSC-25, Indore.



Dr. Rohit Sharma giving his talk

Ms. Sheetal Singh, Research Scholar, presented a poster title **“Investigation of Al Coating and RF plasma cleaning on Cu Mirrors for ITER Application”** In the PSSI-PSC-25, Indore



Ms. Sheetal Singh presenting her poster

Mr. Nishant Bharali, Senior Research Fellow, CPP-IPR, delivered an oral presentation titled **“Plasma Diagnostics and Neutron Emission Studies in Cylindrical Inertial Electrostatic Confinement Devices”** at the PSSI-PSC-25, Indore.



Dr. Nishant Bharali giving his talk

Awards and Achievements



Mr. Meddi Tharun received “One of the Best Papers” award at the 1st International Conference on Power Electronic Converters for Transportation and Energy Applications (PECTEA-2025), Indian Institute of Technology Bhubaneswar, 18-21 June 2025 for his oral presentation on “**New Systematic Design Methodology of Modular Multilevel Converters in Rectifier Applications**”.

Congratulations!!

Certificate of Appreciation received by Mr. Meddi Tharun

Ms. Geethika B R, Research Scholar received “EPS/ PPCF/ IUPAP Student Poster Prize 2025” award at the 51st EPS Conference on Plasma Physics, 7 – 11 July 2025, Vilnius, Lithuania for her poster presentation on “**Study on Polarized Emission and its effect on Laser Induced Breakdown Spectroscopy**”.

Congratulations!!

Ms. Geethika receiving her poster award



Ms. Sumana Hazra got the “Best Oral Presentation Award” for her presentation title “**Plasma treated BiFeO₃ thin films for the superior Ferroelectric properties**” at the 11th Plasma Student Colloquium (PSSI-PSC-2025) held at Centre for Scientific and Applied Research, IPS academy, Indore from 2-4 June 2025.

She is working jointly at Saurashtra University, Rajkot and FCIPT/IPR under the co-supervision of Dr. Mukesh Ranjan.

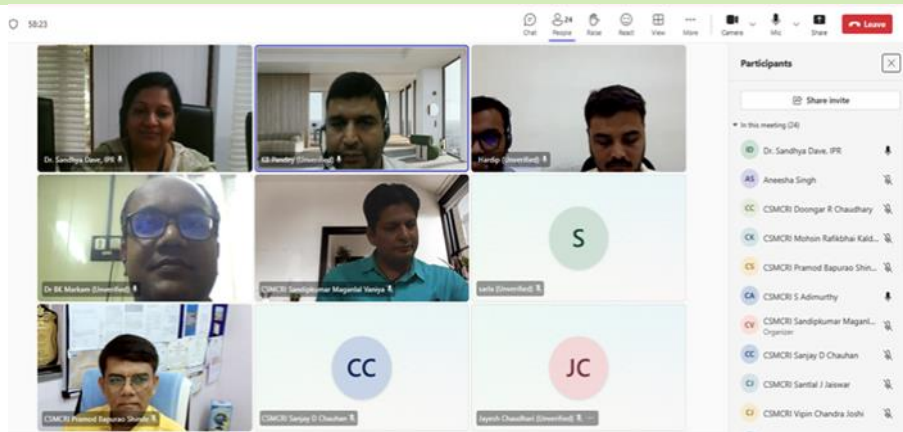
Congratulations!!



Ms. Sumana Hazra receiving her award

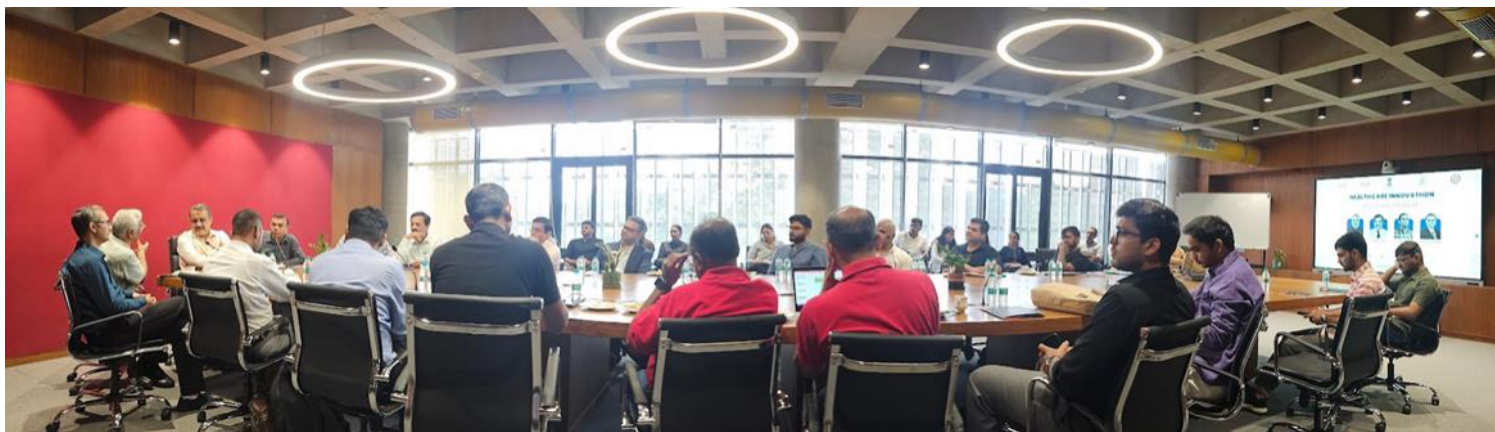
हिंदी कार्यशाला

दिनांक 26 जून 2025 को केन्द्रीय नमक व समुद्री रसायन अनुसंधान संस्थान (CSMCRI) ने ऑनलाइन माध्यम से हिंदी कार्यशाला का आयोजन किया, जिसमें संस्थान की हिंदी अधिकारी डॉ. संध्या दवे ने “कार्यालय में राजभाषा हिंदी का उपयोग एवं कंप्यूटर पर हिंदी में कार्य” विषय पर प्रशिक्षण प्रदान किया। इस कार्यशाला में राजभाषा विभाग पर उपलब्ध ई-टूल्स, हिंदी अनुवाद टूल्स, वॉइस टाइपिंग टूल्स, स्मृति आधारित अनुवाद टूल्स कंठस्थ 2.0, कंप्यूटर पर आसानी से हिंदी में प्रकाशन सामग्री तैयार करना, हिंदी भाषा प्रशिक्षण ऐप, AI टूल्स आदि विषयों पर विस्तार से चर्चा की गई, ताकि कार्यालय में राजभाषा में सुचारु रूप से कार्य किया जा सके।



डॉ. संध्या दवे ऑनलाइन प्रशिक्षण प्रदान करते हुए

i-Hub Gujarat, an incubator established as section 8 company by the Govt. Gujarat has been supporting startups in several sectors. A startup event on 'Healthcare Innovation' was organized on 18th July 2025 by i-Hub at KCG Campus, A'bad, where several ecosystem key dignitaries were invited along with various startups from the healthcare sector. The event was initiated with an inaugural session where dignitaries like Dr. A. M. Kadri, Exe. Director - SHSRC-G; Dr. Mehul Shah, President IMA Gujarat; Dr. Urvesh Shah, Secretary - IMA Gujarat; Dr. Pankaj Nathwani, Consultant - Zydus Hospitals and Dr. Nirav Jamnapara were invited for inaugural note. Dr. Jamnapara presented an overview of IPR's R&D & technological updates to the attendees and showcase a number of healthcare innovations developed by IPR. Introduction about IPR's Atal Incubation Centre was also done for interested startups to approach. Dr. Kaushik Choudhury, CEO of AIC-IPR Plasmatech Innovation Foundation and Mr. Deepak Assudani, Technical Officer - C, PTTS were also present during the meeting. The interaction was fruitful and a number of startups and ecosystem facilitators and mentors expressed their desired to interaction with IPR & AIC-IPR for relevant technology development needs.



Dr. Nirav Jamnapara (R) and Dr. Kaushik Chaudhury (L) attending the meeting



Dr. Nirav Jamnapara being felicitated

In Memoriam

Prof. Raghvendra Singh



BORN: JAN 1, 1955
DEPARTED: JUL 21, 2025

With profound sadness, we announce the sudden passing of Professor Raghvendra Singh, a distinguished former faculty member of the Institute for Plasma Research (IPR), on Monday, July 21, 2025 at the age of 70 years. A leading plasma physicist in India, Professor Singh made pioneering contributions to plasma physics, spanning fundamental plasma dynamics to cutting-edge tokamak research. His internationally recognized work on edge turbulence, geodesic acoustic mode (GAM) dynamics, density limits, momentum transport, and edge-localized mode (ELM) control provided deep insights into complex plasma phenomena. His expertise in analytical modeling, grounded in innovative physics concepts, illuminated results from large-scale computations and offered critical theoretical support to experimental projects at IPR, including the ADITYA tokamak and the Large Volume Plasma Device (LVPD).

Professor Singh was a prominent figure in global fusion research, actively participating in International Tokamak Physics Activity (ITPA) groups and serving as a Visiting Scientist at prestigious institutions such as ITER, UC San Diego, NIFS Korea, Chalmers University, and IPP Jülich. An exceptional teacher and mentor, he guided numerous young researchers at IPR, nurturing their careers with dedication and inspiration. Affectionately known as "Singh-sahib," his vibrant and inspiring presence continues to resonate within the Institute. His loss is deeply felt, and his legacy will endure through his contributions and the lives he touched.



Title	Page No	Title	Page No
Our New Director	01	Academic Visits to IPR	12-13
Gyrokinetic nonlinear study of the ubiquitous mode (UM) in LTX-like Tokamaks	02	Superannuation	13
Installation of Centralized LN ₂ , GN ₂ and Vent lines distribution network	02	Undergraduate Internship programme at CPP-IPR	14
MoU signed between AIC-IPR and HBNI	03	Past Events @ IPR /Upcoming events	15
Doctoral Research Spotlight	04	Conference Presentations	15-17
राजभाषा स्वर्ण जयंती समारोह में प्रतिभागिता	05	Awards and Achievements	18
A Talk on “Global Fusion Scenario & ITER Private Sector Fusion Engagement”	06	हिंदी कार्यशाला	18
हिंदी कार्यशाला	07	AIC-IPR at i-Hub Healthcare Innovation Meet	19
Summer School Program 2025	08-10	In Memoriam	19
IPR participation in “SAMRIDH GUJARAT 2025”	11	Know Your Colleague	20

Know Your Colleague



Mr. Sudhir Rai completed his B.Tech in Chemical Engineering from National Institute of Technology (NIT), Nagpur in 2011. He subsequently joined IPR under the Technical Training Program (TTP) in 2011. Since 2012, he has been associated with the Fusion Fuel Cycle Section of the Fusion Blanket Division. His work primarily focuses on the separation and storage of hydrogen isotopes. He has designed a system for extracting hydrogen isotopes from a liquid lead-lithium eutectic alloy and developed a solid-state storage system using metal hydrides. He contributed in the conceptual design of the Indian Test Blanket Module by providing technical inputs. He has also conducted experimental studies to generate permeation data for structural materials such as SS316 and IN RAFMS, and to evaluate the efficiency of erbium oxide coatings as permeation barriers. Additionally, he has obtained solubility data for hydrogen isotopes in liquid lead-lithium through carefully designed experiments. He loves to play cricket and Table Tennis, and he actively participates in the tournaments.

SSP Students—The final Group Photo



The IPR Newsletter Team

Dharmesh Purohit	Harsha Machchhar	Ngangom Aomoa	Pratibha Gupta	Priyanka Patel	Ramasubramanian N.	
Rohit Anand	Sandhya Dave	Saroj Das	Shravan Kumar	Supriya A Nair	Suryakant Gupta	Tejas Parekh

Institute for Plasma Research
Bhat, Near Indira Bridge
Gandhinagar 382 428,
Gujarat (India)



Web : www.ipr.res.in
E-mail : newsletter@ipr.res.in
Tel : 91-79-2396 2000
Fax : 91-79-2396 2277